

DOCUMENT RESUME

ED 283 639

RC 016 237

TITLE Outdoorsman, Unit II.
INSTITUTION Alberta Dept. of Agriculture, Edmonton.
REPORT NO WP471-83.
PUB DATE 83
NOTE 64p.; For related documents, see RC 016 236-240.
PUB TYPE Guides - Classroom Use - Materials (For Learner)
(051)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Adolescents; *Camping; *Conservation Education;
Foreign Countries; Map Skills; *Orienteering;
*Outdoor Activities; *Outdoor Education;
Preadolescents; Program Guides; Recordkeeping;
Records (Forms)
IDENTIFIERS 4 H Clubs; *4 H Programs; Compasses; *Compass
Reading; Environmental Awareness

ABSTRACT

The second of three units of the 4-H Outdoorsman Program introduces more advanced camping and survival techniques for 4-H members in British Columbia, Alberta, Saskatchewan, and Manitoba. Backpacking, finding food in the wild, making a fire without matches, lashing techniques, axemanship, finding your way (with and without a compass), making a resource map, records and recordkeeping are all discussed with tips, illustrations, and instructions. Achievement Day requirements for the unit's kit are outlined, as well as fun time action projects. Compass exercises and a wildlife puzzle are included. A glossary of map and compass terms, a form for project evaluation, and metric conversion tables are appended. (JMM)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *



ED283639



"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Scott Reid

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PUBLISHED BY
ALBERTA AGRICULTURE

This Manual is produced for 4-H members and leaders
enrolled in the 4-H program and administered by:

The British Columbia Department of Agriculture
4-H Clubs' Branch

Alberta Agriculture
4-H Branch

The University of Saskatchewan
Extension Division

The Manitoba Department of Agriculture
4-H and Youth Section, Community and Family Programs Branch

4-H MOTTO

Learn to do by doing.

4-H PLEDGE

I pledge
My HEAD to clearer thinking,
My HEART to greater loyalty,
My HANDS to larger service,
My HEALTH to better living,
For my club, my community, and my country.

4-H GRACE

(Tune of Auld Lang Syne)

We thank thee, Lord, for blessings great
On this, our own fair land.
Teach us to serve thee joyfully,
With head, heart, health, and hand.



TABLE OF CONTENTS

	<u>PAGE</u>
INTRODUCTION	1
Achievement Day Requirements.	1
BACK PACKING	2
Prepare Yourself and Your Equipment	2
Backpacker's Check List	10
Hiking On the Trail	11
FINDING FOOD IN THE WILDS	12
Common Edible Plants	12
Other Plants	14
FIRE WITHOUT MATCHES	17
Flint and Steel	18
Notch and Drill	19
Batteries and Steel Wool	21
LASHING TECHNIQUES	22
Square Lashing	22
Shear Lashing	23
Lashing Technique for Shelters	24
AXEMANSHIP	25
How to Use Your Axe	25
Sharpening the Axe with a File	27
FINDING YOUR WAY	28
Without Map or Compass	28
How Long?	28
Compass Know How	29
Using the Magnetic Compass	31
Compass Games	37
RESOURCE MAP	38
How to Make a Resource Map	38
Resource Map Symbols	39
RECORDS AND RECORD KEEPING	41
Purpose of Record Keeping	41
What Is a Good Record Book?	41
4-H Outdoorsman Record Book	41
Achievement Day Projects and Activities in the Outdoors	42
Special Activities Participated In	52
Record of Project Meetings	53
GLOSSARY FOR MAP AND COMPASS WORK	54
METRIC INFORMATION	56
PROJECT EVALUATION	58

INTRODUCTION

Welcome to Unit II and more outdoor learning and fun. Unit II offers a challenge to you as a camper. More advanced camp skills are introduced and more concern for environmental study is required.

This unit will try to help you to become a genuine Outdoorsman.

In this unit, as in Unit I, two symbols will be used:



will indicate Achievement Day requirements.



will indicate Action Time: fun projects to be done if you have time.

You will want to develop an outdoor kit or book to display your projects, either a heavy three-ring binder with cardboard pages, or a decorated box. Complete the record book and exercises with a maple leaf symbol for your Achievement Day.

ACHIEVEMENT DAY REQUIREMENTS

1. Complete a detailed study of one animal or bird using the charts in your record book; if you wish you may include a wildlife resource map.
2. Present a summary of all your wildlife observations using the chart in your record book.
3. Present a record of plants observed and display photos or sketches in your outdoor kit.
4. Make plaster casts of two animal or bird tracks and mount in your outdoor kit.
5. Complete the compass exercises.
6. Learn two lashing techniques and display them in your outdoor kit.
7. Go camping and present a log or diary of your experience.
8. Complete the record book, project meetings and special activities.

BACK PACKING

Now that you have learned and practised some basic camping skills, why not try a different type of camping - back packing, an exciting and challenging possibility.

PREPARE YOURSELF AND YOUR EQUIPMENT

To get the most enjoyment from your trip, make sure that you and your equipment are in top condition. Here are some tips to follow before you start packing.

TRAINING COMES FIRST

For that first hike or pack trip, do a little preparatory work on your feet. Condition your feet and legs by daily walks to the corner store - increasing the distance every day or so. Do it in those new boots. Increase the strolls to weekend picnic hikes and finally an overnight backpack trip.

Boots should be of leather, supple and with a light leg sole. Suit yourself as to height, but try to keep them under 1.5 kilograms in weight. They should be large enough to allow for two pairs of socks - a woolen pair worn over a light cotton pair. This double layer not only helps cool the feet by ventilation but protects against blisters.

To help toughen your feet, rub them with alcohol before and after each jaunt. Wash your feet at night before turning in. Apply talcum powder. Trim your toenails properly - fairly short, slightly rounded.

On the trail, make a point of frequent stops, rather than a long push. When you stop, loosen your laces or remove your shoes and socks. If your feet feel hot and there's a stream nearby soak your feet a minute or two. Keep watch for blisters even though you think your program of training has been sufficient. Bandaging any sore spot will help reduce friction and may prevent blistering.

If a blister does develop, don't tear it open. Puncture it with a sterilized needle from the side. Clean it and put on an adhesive bandage.

When backpacking, taking care of your feet is your most important concern; your food, proper shelter, and clothing follow next as essentials.



FOOD

For food use a plastic bag meal system. Label each bag with the day, meal, and contents. For instance, put the correct measure of instant soup for your group in one bag, powdered chocolate in another, dried meat in another, powdered potatoes in another, and pudding mix in another. Place all of these in a larger bag - mark it Sunday dinner or whatever. Do this for each meal of each day of your trip.

Test at home anything you intend to eat on the trail. Some dehydrated foods have more appeal than others. There are tricks to preparation; the longer some dried foods are left in water the better they taste.

Don't depend on catching fish, killing game, or picking wayside berries on any trip. Take your food with you.

In some cases, you must also carry water. If you don't, be perfectly sure of your source.

Many packers depend on open fire methods of cooking. In parks this may have to be in a designated site. Other hikers prefer a small gasoline or alcohol stove, but that means added weight. A handful of matches is easy to carry but equate that against the convenience of a stove or a lack of firewood at the campsite.

For more detailed information refer to the Outdoor Cookery manual.

SHELTER

Your pack shelter must be light, but it also must be water repellent, bug tight, and warm.

The lightest shelter, a plastic tarp, could weigh as little as 0.2 kilograms; it is waterproof, but it won't keep you warm or keep out the bugs. Plastic also has inherent condensation problems.

Specially designed backpack tents can be expensive. The more expensive ones are made of rip-proof nylon, and have sewn in floors, screen doors, and zippers. The two and three man models weigh between 1 and 5 kilograms. Other materials such as the more familiar cotton duck, result in a less expensive tent, but a much heavier one.

YOUR PACK

Maximum backpack weight for a man should be in the 12 - 15 kilogram range, and for a woman 7 - 12 kilograms. If you intend carrying maximum weight, a magnesium or aluminum frame is the way to go. Proper fit will distribute the pack's weight high on the shoulders for less tiring trips. For picnics or short hikes a small knapsack will do.

Scout around before buying, but remember a bargain is no bargain if it breaks down on the trail. A packstrap or buckle that lets go can change fun to drudgery in no time at all.

Loading a pack is a little known art form. Stash your heaviest gear at the top and the lighter pieces at the bottom. This helps the frame do its job of keeping the weight high and easy on your shoulders. Pack pointed objects carefully so they don't jab you in the back.

If the pack has outside pockets these are the places for frequently needed articles (cook kit or camera). Another pocket should hold the first-aid and emergency gear. Draw a chart of your pack with all the pockets, similar to the one following, and label all the articles to be placed in those compartments.

Trail packing and hefting will soon get things organized. Any equipment strapped to the outside of the pack should not stick above your head or beyond your shoulders at the side.

Care of the Pack

Do not drop your loaded pack frame on the ground when taking it off. Sit down and rest the pack on the ground or a convenient rock before swinging out of the harness. When packing, ease things in gently--don't cram. Any seam, no matter how strong, will give under sudden "spot" pressure.

Pack with hard or sharp items rolled inside something soft to protect the bag as well as to prevent possible friction against the body.

Never permit an aluminum frame rucksack (especially when loaded) to be thrown into a heap of gear in a truck or station wagon. The frame can be bent or broken by this treatment. If possible when travelling by public transportation, carry your pack; it will not fare well in a luggage compartment.

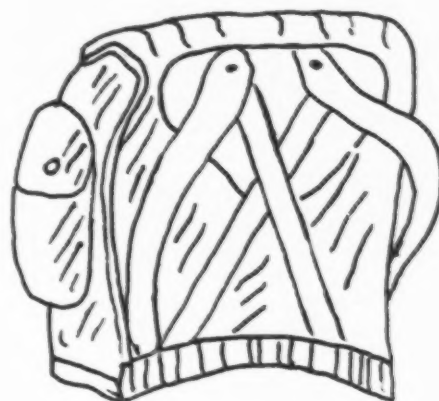


Types of Packs and Packboards

A wide variety of pack rigs are available today. These range in sophistication from army surplus back-packs to the highly engineered alpine rucksacks. Despite the variations in size, price, and comfort, all such units serve one purpose: to allow a human being to carry more on his person than he can stuff into his pockets. Let's take a look at some of the more popular pack rigs.

1. Norwegian Frame Pack

The Norwegian Frame Pack is among the easiest to carry. The triangular metal frame of the pack holds a leather strap which keeps the weight of the pack from bearing directly against your back. These packs are popular among alpinists but are quite expensive in Canada--about forty dollars.



2. The Duluth Pack

A Duluth pack will carry as much as you can lift. Two men can carry a two-week outfit in a pair of Duluth packs.

A Duluth pack is a large pocket of heavy canvas with both shoulder straps and tump line. The tump line is a headstrap to be worn across the forehead to take weight off the shoulders when they tire.

The rugged adaptable Duluth pack is an excellent choice for canoe camping.



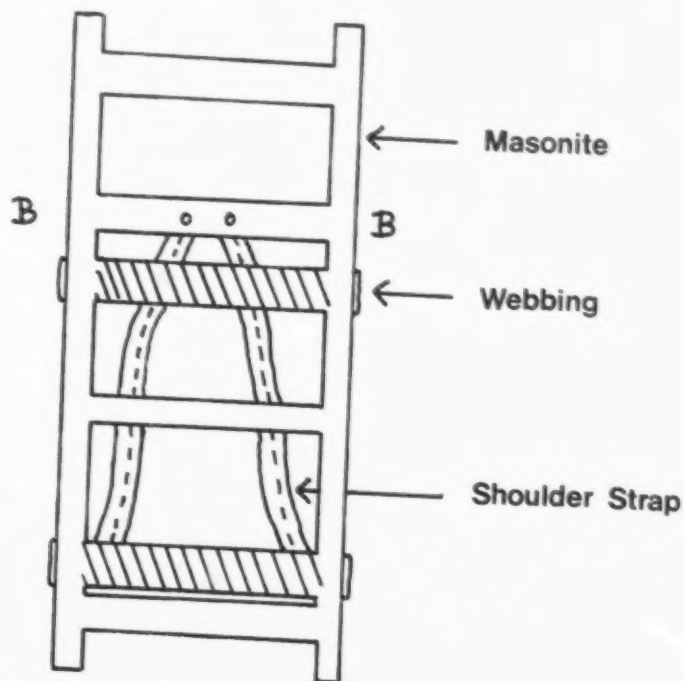
3. The Packboard

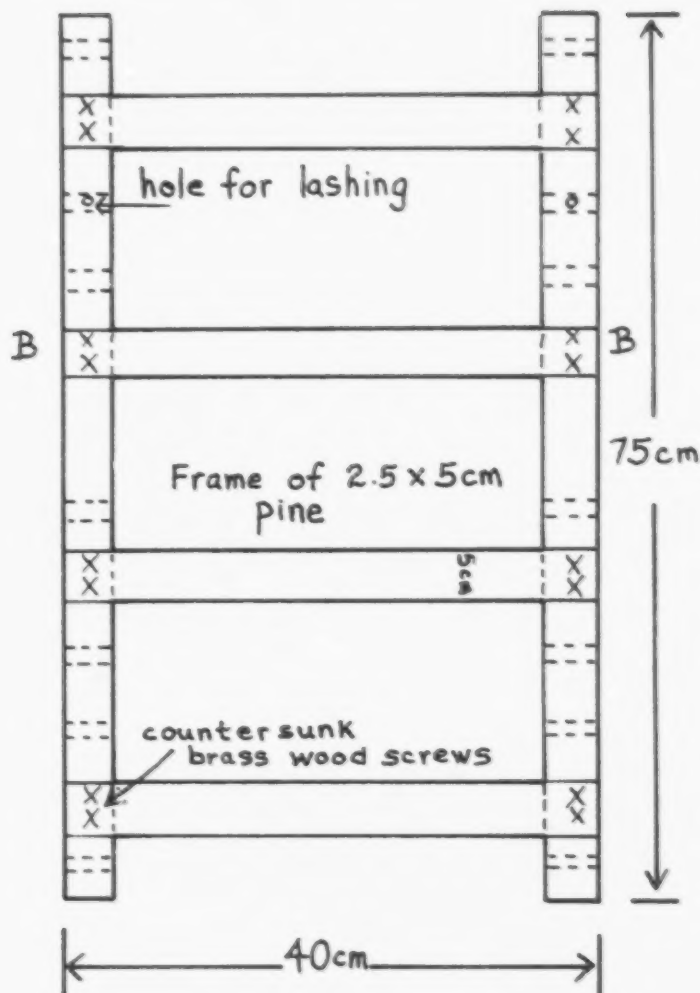
The tool of the professional packer is the versatile packboard. Packboards can be used to carry anything from the hind quarter of a moose to an outboard motor. The advantage of this rig is that, if a man can lift the load, the packboard will hold it so that he can walk with it. A well constructed packboard carries the load high and close to the body. Hence, the packer can walk in an almost erect position.

The Trapper Nelson is the most popular type of packboard. It consists of a wooden frame over which canvas is stretched to cushion the load and allow circulation of air between the load and the packer's back.

It is quite simple to construct a packboard of your own which is similar to the famed Trapper Nelson design. The frame is made of 2.5 x 5 centimetre pine. The horizontal parts are 40 centimetres long while the verticals are 75 centimetres long. Drill holes in the verticals so the load can be lashed to the packboard by passing the sash cord through the holes.

A sheet of masonite between the top horizontals will help support large loads. Eight-centimetre webbing should be laced tightly at comfortable shoulder and waist positions. The shoulder straps are made of one length of 5 centimetre webbing, tapering to 2.5 centimetres at the ends to pass through the buckles and snaps. The shoulder strap is secured to horizontal (BB) with a screw and a washer. (See following diagram of packboard.)





4. Make Your Own Pack

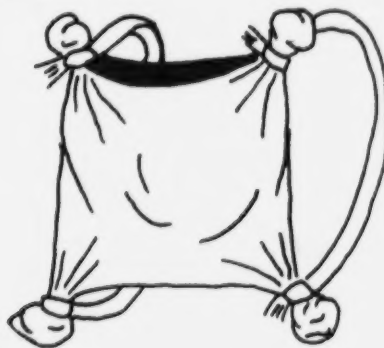
If you wish to construct your own pack-sack, there are patterns available to do so. The advantage in doing this, other than cost, is that you can make the exact size and number of pockets that you require. You can make a wooden frame or purchase an aluminum frame for your size, and attach your bag to this. Ready-to-assemble kits are available from sporting goods stores and mail-order catalogues. Mechanix Illustrated, May 1976 issue, has a very good customized pack pattern. Refer to The Leader's Guide for addresses you can write to for patterns to make tents, packs, ponchos, down jackets, and other camping gear.

Follow these general guidelines when designing your pack:

- a. The pack should cover three quarters of the frame, leaving room for a rolled sleeping bag and pad under the pack.
- b. Insert a curved zipper instead of a straight one to give you a larger opening; this makes it easier to get at your stored gear.
- c. Use nylon coil zippers to prevent corrosion or freezing.
- d. Make the pack approximately 17.5 centimetres deep to ensure a balanced load when packed.
- e. Use medium weight polyurethane-coated Cordura nylon, nylon oxford cloth, lightweight duck, or canvas.
- f. If you use a bright colour it will be easy to spot at a distance.

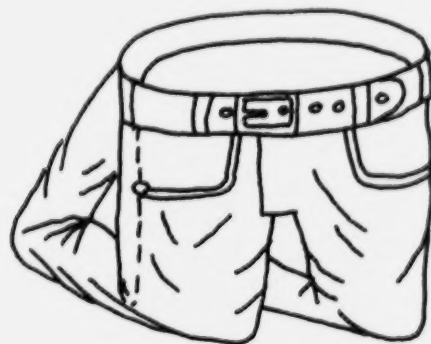
5. Emergency Packs

If you need a pack to hold gear in an emergency, use a cloth sack and rope to make a sack pack.



Tie a piece of wood, rock, or pine cone in each corner of the sack. Then tie the rope around the sack at the corners. The rock will prevent the rope from slipping. Wrap the rope with cloth to prevent cutting into your back and shoulders.

Make a pants pack by tying the legs to a belt to make straps.



CLOTHES

Regular camp clothes will do on short hikes. On a pack trip, long-sleeved shirts and trousers help ward off bugs, thorns, and sunburn. A wide brimmed hat will shade the neck and shed rain from the same area. On that line, be sure to include light weight rainwear. Take the poncho you made in Unit I.

SLEEPING GEAR

Weight is again a factor in selecting a sleeping bag. Downfilled are the lightest, goose down is the best, but there are less expensive heavier choices.

YOUR DOWN-FILLED SLEEPING BAG

Never roll a down bag. Stuff it into the sack provided, with the bag liner inside. This prevents flattening the down. Place your sack with the bottom on a flat surface. Start stuffing from the lower end of the sleeping bag (so the air isn't caught in the bag). As you stuff, pound the sleeping bag into the empty places. When you take your bag out of the sack, shake it so the down will fluff up (this gives more warmth). As a matter of fact, the sleeping bag will "creep" out of the sack as soon as you undo the draw string - goose down bags "love to rise".

Always use a liner and a ground cloth with your sleeping bag. Zip the bag open and turn inside out to air after use. Protect from soil, snags, and tears. A good goose-down bag is a fragile and precious possession, to be prized and carefully guarded by an experienced back-packer. Of course, a good down bag should never be shipped in its self-fabric case without an outer, tougher container, and should never be stored stuffed tight in the case.



BACKPACKER'S CHECK LIST

Flap Pocket

Maps Fire Permit
 Notebook, Pencil Identification
 Medical, Allergies & Restrictions

Back Pocket

Plastic Bowl Plastic Cup
 Pot Tongs Tablespoon
 Waterproof Matches Sunglasses
 Lunch and Trail Snacks

Upper Left Pocket

1 Litre
Canteen

Upper Right Pocket

1 Litre
Canteen

The following items are so important
 they should be carried on your person:
 Knife, Compass, and Waterproof Matches.

Upper Compartment

Cook Kit Backpackers' Grill Stove, if needed Bags of Food Extra Bags Can Opener Rubber Bands (Tent - If too big for lower compartment)	Condiment Kit Sugar - Milk Coffee - Tea Powdered Juice Cooking Oil Salt - Pepper
---	---

Lower Left Pocket

Toilet Kit
 Toothbrush
 Toothpaste
 Soap
 Paper Towels
 Toilet Paper
 Scouring Pad
 Flashlight
 Spare Bulb and
 Batteries

Lower Compartment

Air Mattress & Repair Kit or
 Foam Pad
 Tarp & Ground Cloth or
 Tent
 30 Nylon Cord
 Underwear, Socks
 Bandanas (2)
 Windbreaker Jacket
 Stocking Cap
 Rainwear

Lower Right

First Aid Kit
 Sunburn Ointment
 Repellent
 Chap Stick
 Whistle
 Matches in w/p Case
 Candle
 2 Dimes
 Needles, Thread
 Signal Mirror
 Safety Pins
 Water Purification

Backpacker's Check List

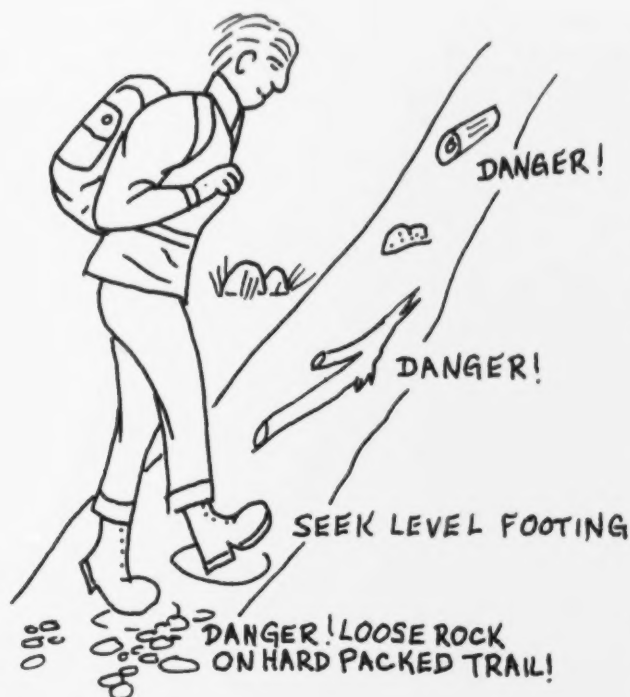
Here's a handy way to organize
 your trail equipment. Just
 combine things if your pack-
 sack has fewer pockets.

Stuff Bag
 Sleeping Bag
 Small Pillow (if used)

HIKING ON THE TRAIL

Hike in single file along the trail. Stay far enough behind the person ahead so that a branch he pushes aside will not flip back and hit you. He may not know that a branch should be pushed up or down, not sideways.

You may climb up and down steep slopes by zigzagging back and forth across the slope. In walking up or down a steep slope, lean out slightly over it. When climbing, place your foot above a pebble or rock and step down upon it to make sure your footing is as level as possible. When you come down a slope, step just above and on small rocks. If the ground is hard with loose gravel, beware of stones rolling under your feet. Keep from stepping on short pieces of fallen tree limbs that may roll. Limbs on the ground and sloping with the hill cause slipping too.



When the trail leads over a rocky area, stepping from rock to rock is safer than trying to step over and between them. Go slowly and look the area over carefully. Choose rocks that look solid to step on, and don't use your hands for climbing. Know where you're stepping. Rock piles are favourite haunts of snakes and they object to being disturbed.

RESTING

If you begin to puff and perspire, pause a few minutes to look around, adjust your clothing, or just plain puff. It's better to pause a moment than to sit down for a long rest. Cooling off makes your muscles stiff and the rest of your climb will seem much harder.

Rest to catch your breath between 25 and 50 steps from the crest of a hill rather than pushing to the top. There will be less wind below the crest. When you reach the top, you can catch your breath, then cool off as you walk along the crest or start down the other side. Cooling off while you're on the move keeps muscles from getting stiff.

FINDING FOOD IN THE WILDS

How about food? What can you eat and what shouldn't you eat? This can be a problem. For example, there are nearly half a million plants that scientists know about; of these, about half can be eaten. How can you tell which ones?

1. If you see any birds or animals eating a plant, it is likely to be safe.
2. If it is absolutely necessary to test a plant to see if it is harmful, be sure to do it in stages. That is, first try just a little of it, without swallowing. After a while if you feel well, try more, swallowing just a little. After a short time try more. Keep doing this until you are sure.

Do not test plants with milky sap or juices. Do not eat any plants with soiled or blackened leaves.

3. Unless you are absolutely familiar with mushrooms, do not eat any of them. Some types of mushroom and water hemlock, for example, can be deadly even in small doses.
4. Many plants which are poisonous when raw are edible when cooked, but this is not a rule that can be followed in every case. The following diagrams show some of the more common edible plants.

COMMON EDIBLE PLANTS



DANDELION--Leaves and roots may be eaten raw or boiled.



HORSETAIL--Root-stalks should be boiled. Young stalks may be peeled and eaten raw.



BRACKEN FERN--Boil young unfolding shoots. Peel and boil heavy rootstalks.



LICHENS--Soak, dry, crush, and soak again for several hours. Cook for about 20 minutes.



NETTLES--Leaves make excellent greens and roots may be roasted.



PLANTAIN--Leaves may be cooked or eaten raw. The older leaves are sometimes used to make tea.



PUFF BALLS--Eat when white. Best fried but may be eaten raw.



SALMON BERRY--Berries are edible. When peeled, the young shoots may be eaten.



SKUNK CABBAGE--Root and inner section of leaves may be cooked like cabbage. Change boiling water at least twice.



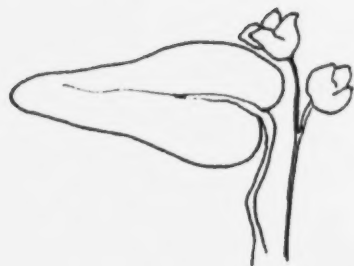
THISTLE--Root is edible. May be peeled, eaten raw, boiled, or roasted.



FIREWEED--Young stems may be boiled. When older, the stalks are split and contents are eaten.



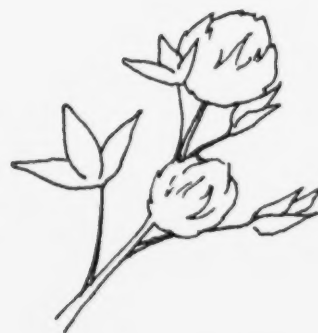
HAZEL NUT--The nut meats are excellent food at any stage of development.



YELLOW POND LILY--
Rootstalks may be
eaten raw or roasted.
The green seed pods
may be sliced and
eaten as a vegetable.



CATTAIL--Eat tender
shoots raw or boiled.
Boil or roast under-
ground stems. Collect
the blooming heavy
pollen, form into
cakes and bake.



CLOVER--The flowers
may be eaten raw.
The roots are sweet
and pleasant to the
taste.



ACTION TIME

Colour the plants found on pages 12 - 14 accurately so you can
recognize them when you see them outdoors.

OTHER PLANTS

WILD ONION -- Found year round but difficult to locate in winter.
Bulb is boiled or eaten raw.
Greens can be fried or eaten raw.

WILD RICE -- Tall grasses found along swampy streams, rivers, and bays.
Stems and roots are best in spring or summer.
Grain is best in later summer or fall.
Lower stem and root shoots are sweet.
Remove tough covering and chew central portion.
Grain is excellent.

BERRIES -- Currants and gooseberries:
Low, sometimes prickly, shrubs.
Eaten raw or cooked.

Blackberries and raspberries:
Shrubs nearly worldwide.
Raw or cooked.

BERRIES --

Blueberries:

Low bush - found in dry locations though also in the region of muskeg.

Medium or normal type of blueberries found in dry burned-over areas in the north.

High bush - (taste a little different) found along the edges of muskeg or bog.

The natives have dried blueberries, smashed them into meat, mixed them with bannock and used them as a thickening for soup.

Cranberries:

High bush - are found year round. They can easily quench thirst. Though bitter, they can be eaten as a dessert or added to meat or mixed in bannock dough.

Chokecherries:

Grow on willow type trees and shrubs.

Are black in colour when in ripest condition.

Can be smashed with two stones and fried with lard.

ROSES --

Petals can be eaten.

ROSEHIPS --

Reddish-orange, berry-like fruit that have developed from blossoms. They are valuable to a diet because of the abundance of Vitamin C they contain.

WILD TURNIPS-- Boiled.

TIGER LILY

PETALS --

Eaten raw.

NETTLES --

Used to make soups.

MUSKEG TEA --

Gathering of leaves.

TREE BARK --

Some tree barks can be eaten if necessary. The inner bark between the wood and the outer bark can be dried and ground between two rocks and made into a "flour" and eaten. This won't be very tasty, but it will offer some nourishment. The birch, cottonwood, willow, and all pines are types which can be easily identified and used for this purpose.

BIRCHES --

Birch soup:

Inner bark is especially sweet. This cambium is enjoyable raw or it can be chopped into bits or cut into lengths for adding to soups and stews.

Note:

Bark from the birch is excellent for building fires under adverse conditions. It is also used as a water proofing cover for shelters in larger quantities.

It can be shaped and used as a pot or pail for carrying water or a plate on which to put food. Natives shaped birch bark in the shape of a cone, larger at one end leaving only a small hole. This they used to call moose when hunting, the smaller end serving as a mouthpiece.

POPLAR --

In spring usually the sweetish sap layer is eaten raw or cooked.

SPRUCE GUM -- Pitch obtained from spruce tree and chewed.

Note:

It is also used as a medicine for cleaning an infectious wound. Hold in place.

The bark can also be used in the same way.



FIRE WITHOUT MATCHES

Early campers had no matches. They had to make their fire by more primitive means. It is good to know how they did it in case you ever find yourself without matches in camp.

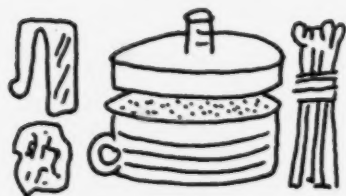
Before matches were invented, the common way of making fire was by striking steel against a piece of flint and catching the spark in tinder. To make fire this way, look for a piece of flint around your campsite. The steel can be provided by an old file, or, if necessary, a knife blade.

In colonial days people struck a fire with flint and steel. The spark was caught in tinder in a tinderbox which next ignited a sulfur-tipped spunk. American Indians soon learned the trick and carried flint-and-steel sets (see diagrams below).



Flint

Flint, Steel, Tinderbox, and Spunks



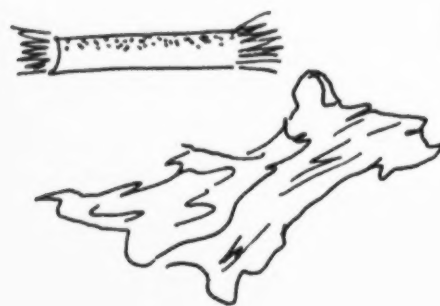
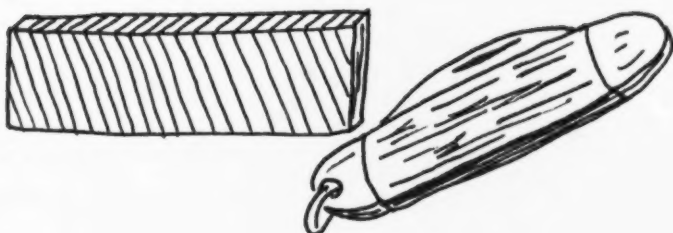
Steel looped for a handle



Indian Flint-and-Steel Set



FLINT AND STEEL

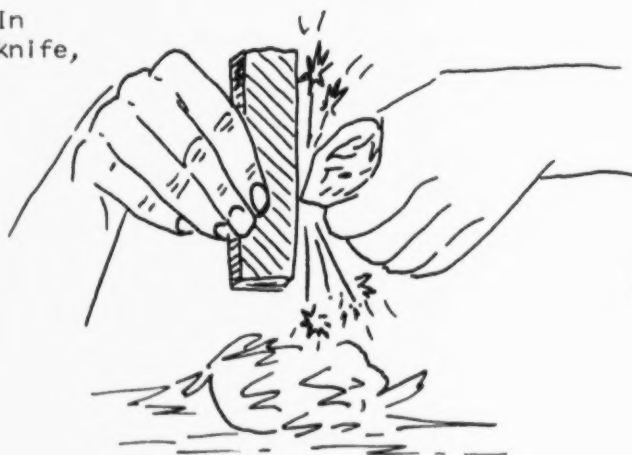


For tinder, char a small cotton rag, or use a piece of lighter wicking.

For steel use a piece of an old file. In an emergency you can use the back of a knife, but the steel will be nicked.



Place the ember in dry cedar bark. Blow it into flame.



The usual way of making fire is to throw sparks into tinder lying on the ground by striking a sharp corner of flint with a steel edge.



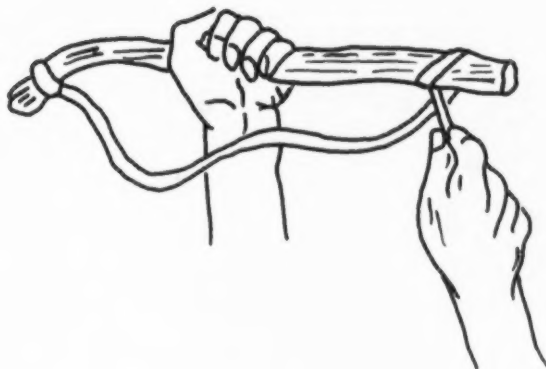
A better method is to hold tinder on top of the flint in one hand, and throw sparks from the flint and steel into it.

NOTCH AND DRILL



Make a spindle 2 cm to 2.5 cm in diameter, about 25 cm long. Whittle it roughly octagonal, round one end and point the other.

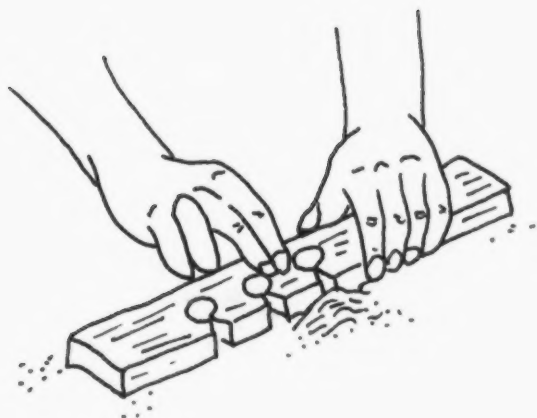
The head block is made of hardwood and has a hollow for holding the upper end of the spindle. Reduce friction with soap.



Make a bow from a stiff branch. Bore a hole near each end of it with the awl of your knife. Pull a thong through the holes. Tie a knot in one end, fasten the other end with a half hitch.

The fire board is about 2 cm thick, 8 cm wide, 40 cm long or longer. Cut a number of notches along the edge, about 2.5 cm deep. Carve out circular hollows to fit the bottom end of the spindle.





Twist bowstring once tightly around the spindle. Hold the fire board steady on the ground with one foot. Place one end of the spindle in a hollow on the fire board. Place the head block over the top end of the spindle. Press down on the head block while moving the bow from side to side. Keep your left wrist firmly against your left leg. As the smoke rises press harder.



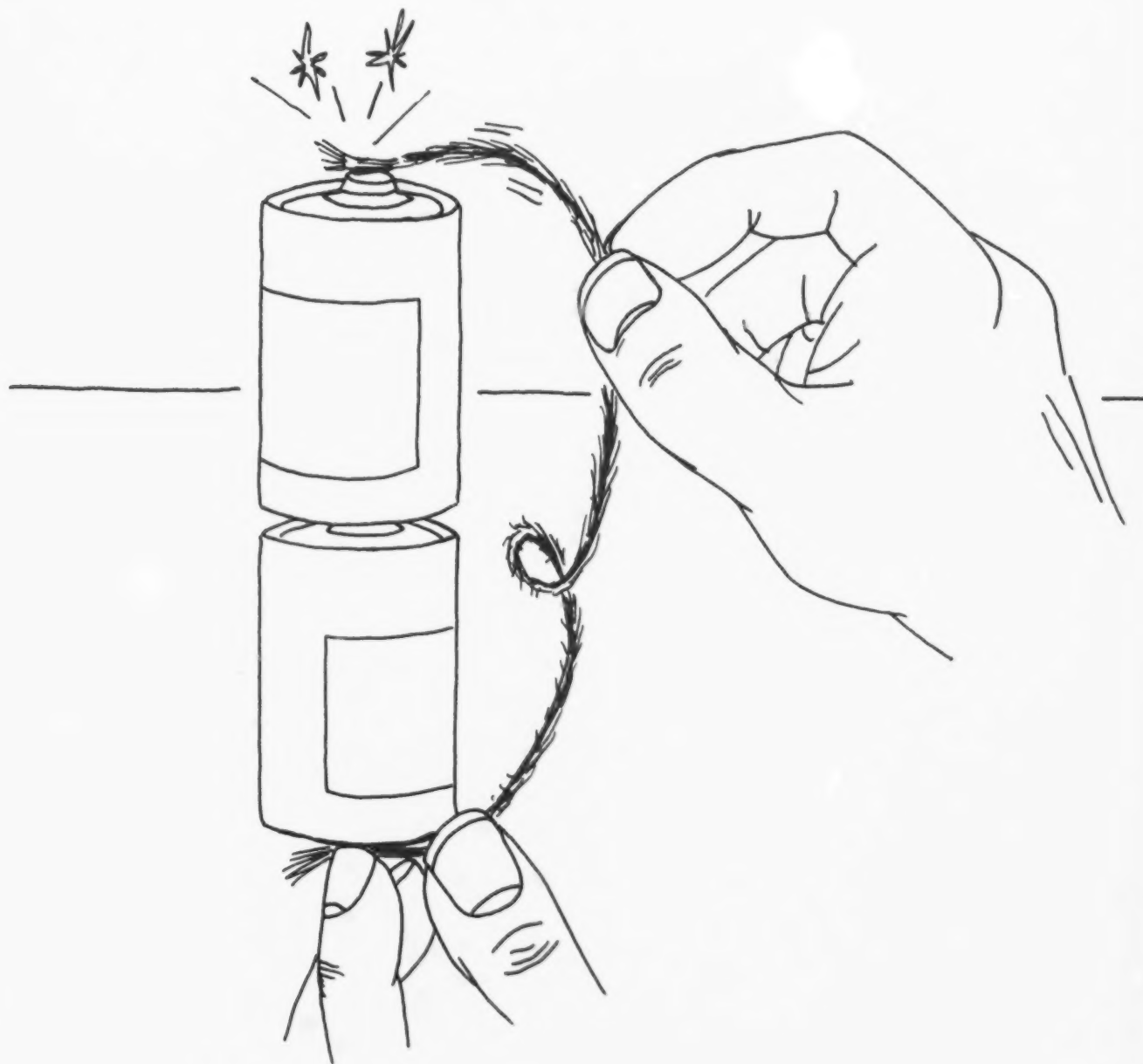
When an ember has formed, knock it from the fire board into the shredded cedar bark.



Fold tinder around the ember. Blow ember into the flame with your mouth, or swing through the air until the bark bursts into flame.

BATTERIES AND STEEL WOOL

Using two good flashlight batteries and a very fine grade of steel-wool, such as 00 grade, a spark can be formed to start a fire. Tear a 1 centimetre strip from the roll of steel wool. Unroll to a length of about 12 centimetres. Place one battery on top of the other both with right sides up. Hold one end of the steel wool under the lower battery; with the other end, rub the top of the upper battery until a spark forms. This spark can be used to ignite your tinder.



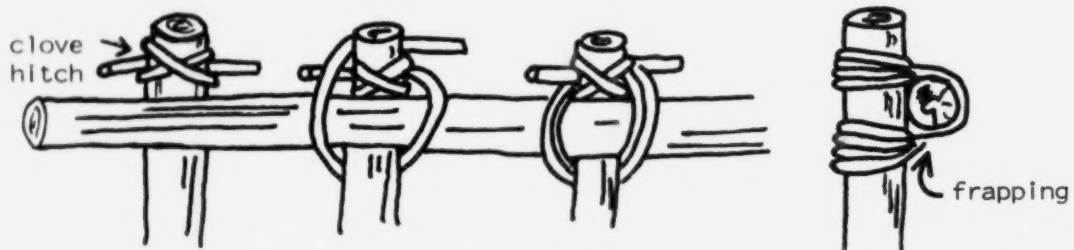
LASHING TECHNIQUES

Lashings are particularly useful in camps where you desire to construct equipment which does not need to be permanent. Lashings take the place of nails. Sash cord or binder twine should be used for lashings.

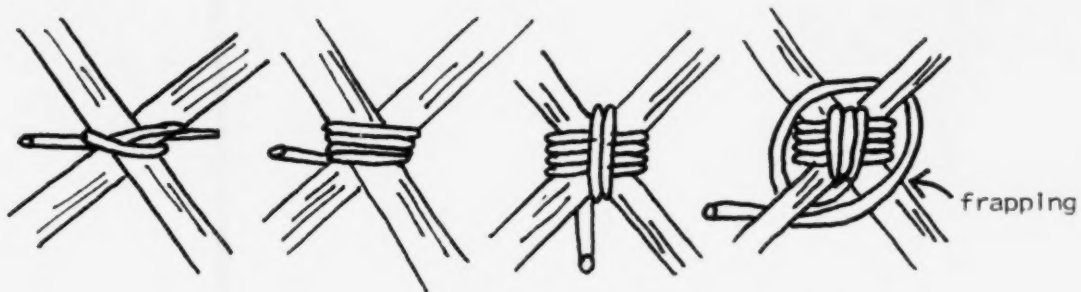
SQUARE LASHING

A square lashing is used to join two poles at right angles to one another as in the construction of a lean-to.

Start the lashing by securing one end of the cord to one pole with a clove hitch. Take at least four turns around both poles and tighten the lashing by taking several hard turns between the poles and over the previous windings. Tie the loose end.



SQUARE LASHING



DIAGONAL LASHING

SHEAR LASHING

Shear lashing is used to erect shear poles for a wall tent, construct tripods, latrines, and many other useful items of camp equipment.

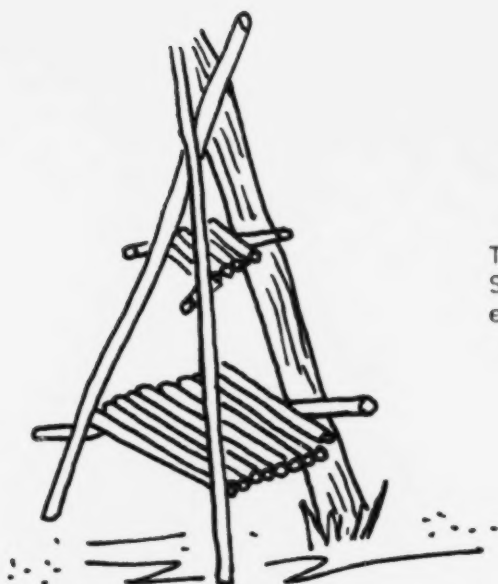
Start the lashing with a clove hitch, then take several turns around both poles while they are parallel to one another. Pass the cord between them as it will tighten as the poles are spread.



Obtain a length of sash cord and practise these knots and lashings. When a shoe string breaks, when a rope is too short, or when a boat needs to be moored securely, you will be able to use the most effective knot.

Try using lashings to construct the following equipment. Make sure to use dead or old branches whenever possible.

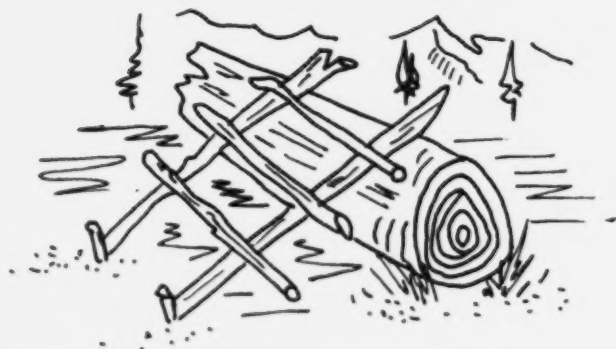
Here--a flat stone can be put there instead of a basin to make a chair.



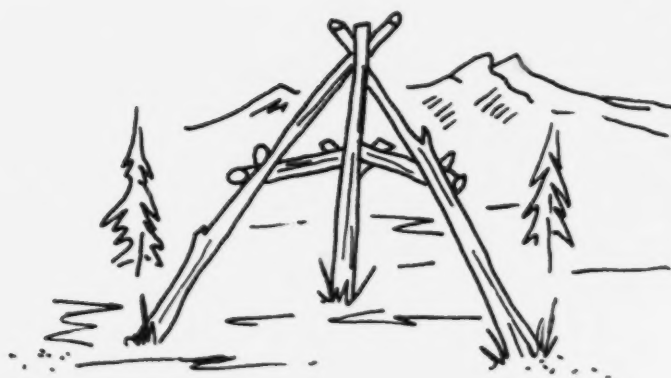
Tables or shelves are always useful. Store the compass and timber cruising equipment there so they won't get lost.

To store heavier equipment - your mess kit or food - try this. If you thatch three sides, you can keep things from getting wet. If you thatch all four sides with evergreen boughs, you can even smoke fish or rabbits in it.

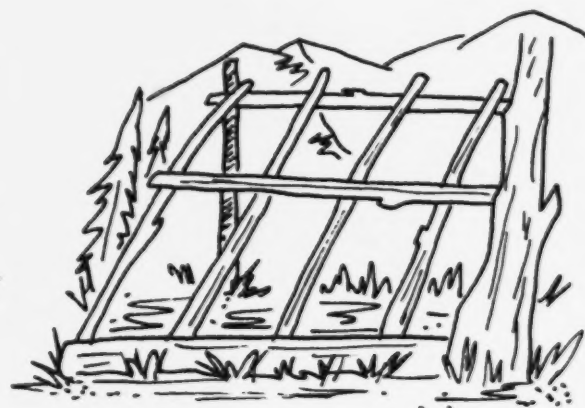
LASHING TECHNIQUE FOR SHELTERS



LOG SHELTER



A-LINE SHELTER



LEAN-TO SHELTER



For Achievement Day, display two lashings and describe their use.

AXEMANSHIP

The proper use and maintenance of your axe is important to your personal safety.

Never buy or use a hatchet! Experts seldom use a hatchet and only then with great care and much suspicion. A hatchet is more likely to injure you simply because the head is much closer to you. Use a long-handled axe. If it is too heavy, find one with a lighter head. A 1.0 kilogram axe with a 70 cm handle is a good camper's axe.

HOW TO USE YOUR AXE

Keep the axe sharp - a dull blade is apt to glance from a log or bounce from a block instead of "biting in" to the wood.

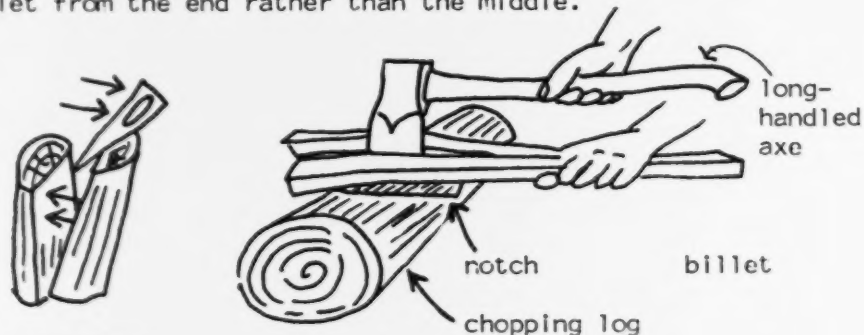
Be sure that the chopping area contains no obstacles that may get in the way of your backswing i.e. branches, underbrush, guy-lines or people.

SPLITTING WOOD

Make sure that the wood to be cut is placed so that it will not roll. A chopping log with a notch in it for the piece of wood is good but never put your foot on the log or a piece of wood to be cut.

Spread your feet well apart and stand on the side of the log opposite to the one you are cutting on. Be sure that your footing is secure and that your legs, feet, and hands are out of the line of fire.

The secret in splitting wood is not to wedge the halves apart by driving the blade through the block, but to pry them apart by flipping the axe to one side after the blade enters the wood. Split the billet from the end rather than the middle.



SPLITTING

SPLITTING KINDLING

HINT: The chopping log is very important and can prevent many accidents. Always have your axe sticking into it and not lying around.

Check often to see that your axe-head is secure and don't use an axe that has become unwedged.

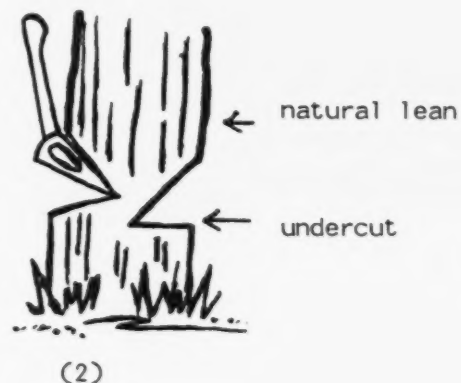
When not in use, cover your axe with its guard or imbed it in the chopping log.

Always keep your eyes on the cut.

Always give a dead tree a couple of whacks with the axe before you start to fell it, to remove dead branches which could fall on you. Don't cut live trees.

FELLING A TREE

Look at the tree and decide which way it leans. Plan to have it fall in that direction. To begin, stand at right angles to the direction you want it to fall and make a notch. This notch should go slightly more than half way through the tree. Cut a second notch on the opposite side of the trunk and slightly above the first. As the tree begins to fall, step to the side so that if it kicks back and up, you will not be hit.



Direction of fall

At camp, set aside a specific area for splitting and chopping up wood for both safety and tidiness.

When carrying an axe, always make sure that the blade faces away from you. So don't carry it over your shoulder, but grasp the handle near the head and turn the axe head away from you while you are walking naturally - the axe at your side.



SHARPENING THE AXE WITH A FILE

Hold the axe head securely on your knee with the edge facing away from you.

Apply pressure along the edge on the forward stroke of the file only.

File both sides of the axe equally to a sharp cutting edge, but be careful not to make the edge too thin or it will crumble or bend when you chop.

Finish off using a carborundum stone with a circular motion along each edge. Water or drops of oil on the stone aid in the final sharpening.

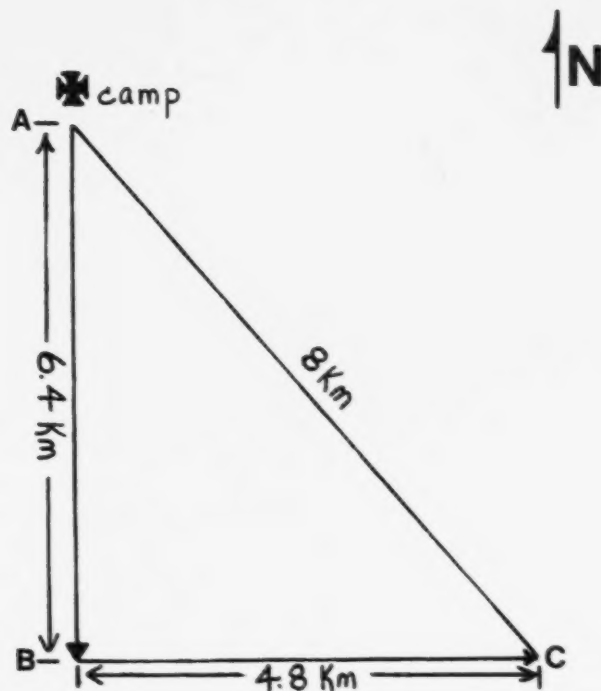
FINDING YOUR WAY

WITHOUT MAP OR COMPASS

Do you remember the techniques for finding your way in the outdoors from Unit 1? How about reviewing them before learning one more new one.

HOW LONG?

Very often time is a more important measure of distance to the outdoorsman than kilometres. A watch can become a basic tool for land navigation. By timing his travel, a hunter can know how far he has gone and how soon he must start his return journey if he is to arrive back at camp at a certain hour. For instance, if a hunter walks south for one hour and twenty minutes, he has probably travelled 6.4 kilometres. If he walks east for another hour, he has probably travelled some 4.8 kilometres. Simple geometry will tell you that he must then walk 8 kilometres to the northwest to return to camp. This trip will take about one hour and forty minutes.



$$\begin{aligned}(AB)^2 + (BC)^2 &= (AC)^2 \\ (6.4)^2 + (4.8)^2 &\approx 8^2 \\ 40.96 + 23 &= 64 \\ 41 + 23 &= 64\end{aligned}$$

COMPASS KNOW HOW

The magnetic compass is an instrument that will allow you to find your way in unfamiliar territory without the aid of sun or stars.

CONSTRUCTION OF THE BASIC COMPASS

Originally the compass had only four main divisions, or cardinal points (North, South, East, and West). The spaces between the cardinal points came to be divided and subdivided until there were 32 points on the compass. The Mariners' Compass of today still uses these points, and naming them in order is called "Boxing the Compass". Thus the eight points between North and East are called North-by-East, North-Northeast, Northeast-by-North, Northeast, Northeast-by-East, East-Northeast, East-by-North - and so on around the circle. (N, S, E, W, NE, SE, SW, NW, NNE, ENE, SSE, SSW, WSW, WNW, NNW.)



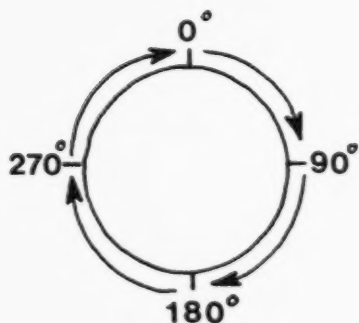
ACTION TIME

Cut a square of paper 10 x 10 centimetres. Fold it in half with a sharp fold, then in quarters, eighths, and sixteenths. By cutting the free edges, shape it into a circle. Now open the paper and mark the paper compass with the sixteen compass direction markings.

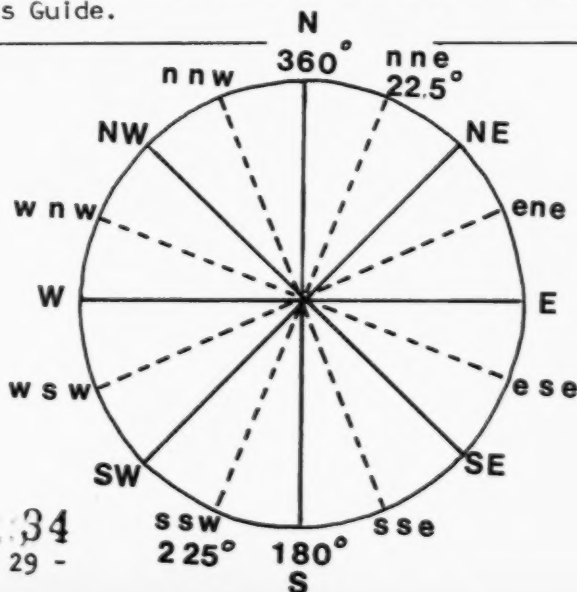


ACTION TIME

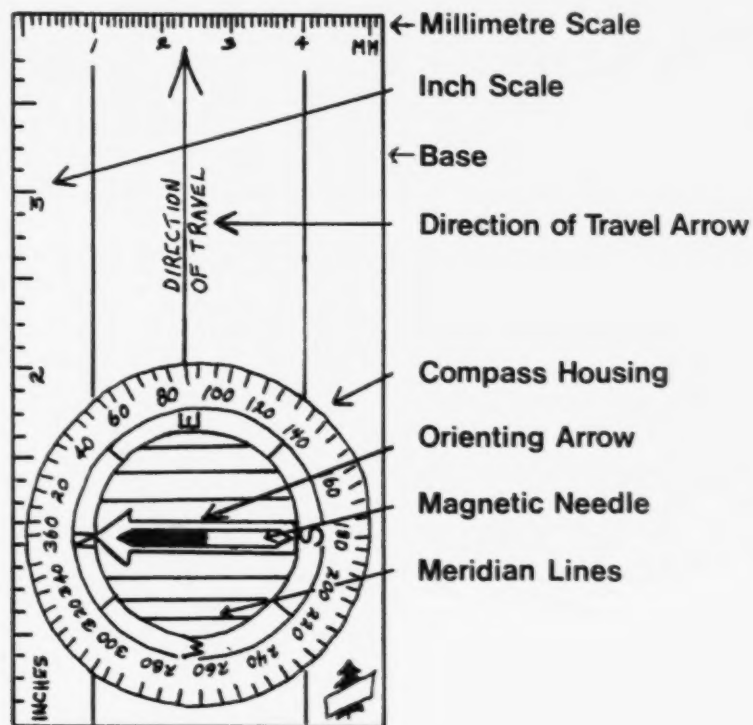
With a red pencil and a protractor, mark the circle degrees on your paper compass, starting at 0° at North and proceeding clockwise to 360°. A few markings have been done in the manual. Answers are found in the Leader's Guide.



Azimuth



Compasses come in all shapes and sizes, some easier to use than others. Perhaps the most versatile is the Silva Compass also known as the Orienteering Compass. This instrument has three main parts: needle, housing, and transparent base plate.



The magnetic needle is a piece of thin, flat steel supported on a point - usually a sapphire. The north end of the needle is painted red and white, the white being luminous for night work. Can you find it in the diagram?

The housing is made of a non-magnetic metal. Around the inner rim of the housing are marked the four cardinal points - North, East, South and West - plus lines to indicate secondary points. The outer rim of the housing is graduated into two-degree units. Printed inside the housing, under the needle, is a black arrow, the "orienting arrow", that corresponds to the North (360°) mark. Every twentieth degree is marked. Hence, the numbers 20, 40, 60, etc. up to 360 degrees will be found on the compass.

On some models the inside of the housing has red lines on both sides and parallel to the orienting arrow. These are used in taking bearings off a map and are called "compass meridian lines" or "orienting lines".

The rectangular base plate holds the housing, which is free to turn. It holds the "direction-of-travel arrow". Where the tail of this arrow meets the housing, it acts as the index pointer against which to set the number of degrees for any desired course.

The long sides of the base plate are parallel to the direction-of-travel arrow and have an inch scale along one side, and a millimetre scale along the other.

USING THE MAGNETIC COMPASS

In simplest terms, a compass is used to get from Point A to Point B, when Point B will be out of sight all or part of the time. Point B can be selected either from some visible landmark in the field or from a certain feature on a map. Once selected, the true bearing (i.e. angle from True North) of the proposed line of travel toward it is found. By frequent sightings with the compass, this bearing or course is then followed until Point B is reached.

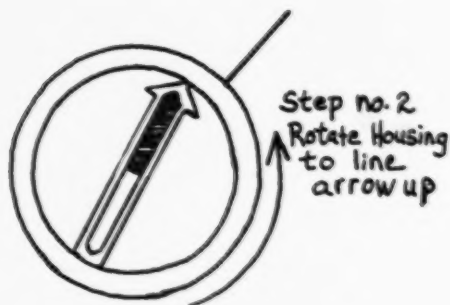
TAKING A BEARING

Hold the Silva compass in front of you.

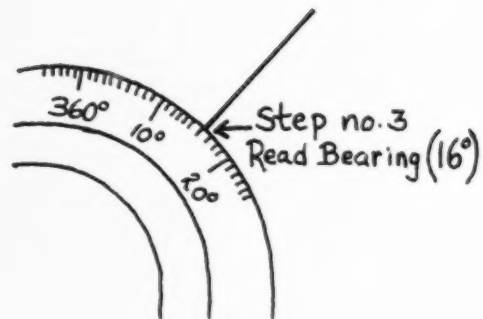
Step 1: Select a building, tree, or other landmark. Face this object, then point the direction-of-travel arrow toward the object.



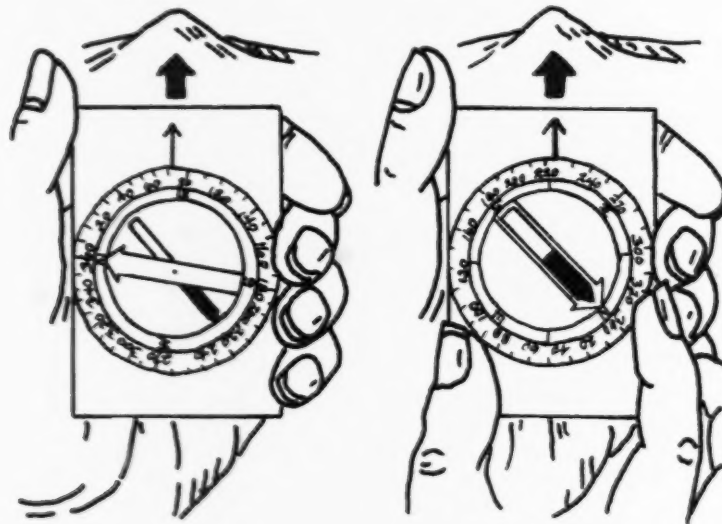
Step 2: Keeping the base plate steady and level, turn the housing until the red north end of the orienting arrow and the magnetic needle are lined up.



Step 3: Read the bearing (the degrees of the direction) on the outside rim of the housing where the index pointer touches the housing.



Another example of finding direction with a compass follows:



To find direction with the Orienteering compass, point the direction-of-travel arrowhead to the landmark, turn the housing until the needle lies over the orienting arrow. The bearing to the hill is 225 degrees.

FOLLOWING A BEARING

Once the bearing of your landmark is set on the compass, you can use it to reach your destination by:

1. Holding the compass level, turning it with your body until the magnetic needle and orienting arrow overlap. The direction-of-travel arrow now points in the direction you wish to go.
2. Choose some "nearby" landmark that is in line with this direction.
3. Walk to it. Reorient your compass, sight on a new object, and continue this procedure until your destination is reached.

Indoor Compass Practice

To learn how to use an Orienteering compass for taking direction bearings, complete the following exercises found on pages 33 and 34.



ACTION TIME

Stand in the middle of the room with the Orienteering compass. Using the method described for finding direction, determine five directions from where you are (example: to the door, to the window, and to the picture of the club).

PACING

Often more than one bearing will be needed to reach a destination. This requires that some simple means of knowing where to alter course is needed, especially if the turning point is not marked by any distinctive feature. Timing yourself from point to point is unsatisfactory because your rate of travel will vary with the terrain, cover, season, degree of tiredness, and other factors.

Pacing is the easiest way to keep track of the distance between points. One pace is the distance covered from left foot to left foot, or right to right, and it differs among individuals. The simplest way to calculate your own pace is to take a string of known length, and practice pacing this distance over various kinds of terrain: on the level, uphill, downhill, through the woods, and so on. Then calculate the length of your pace for each type of terrain. Once you have mastered a steady pace, it will be possible to walk on one bearing for a given distance, change to a new bearing for a distance, and continue doing this until you arrive at your objective. Pacing is particularly useful for walking courses previously plotted on a map. (In Unit I you did an exercise in pacing; check your manual, repeat the exercise, and compare with your measurements this year.)



ACTION TIME - Using Your Compass

Place a stake in the middle of a field. This will be the starting point for the compass exercise that follows.

Example: Start at the stake and pace

30 metres on a bearing of 58 degrees
18.5 metres on a new bearing of 144 degrees
54 metres on a new bearing of 221 degrees
12 metres on a new bearing of 350 degrees
24 metres on a new bearing of 33 degrees

From your final point, the bearing to the starting stake is 303 degrees and the paced distance is 14 metres.

To summarize:

58 - 30 metres
144 - 18.5 metres
221 - 54 metres
350 - 12 metres
33 - 24 metres
303 - 14 metres

RETURNING TO STARTING POINT

To retrace your route with a compass use it in reverse. Hold the instrument with the direction-of-travel arrow pointing toward you instead of away. Then orient the compass, select a landmark in line with the direction-of-travel arrow, and walk to it. Follow this procedure until you reach your starting point.

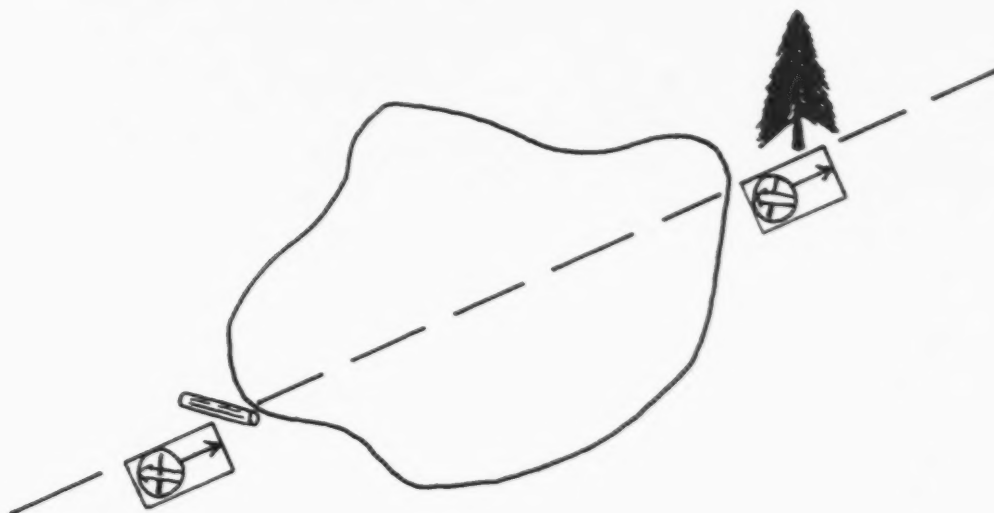


ACTION TIME - Tree Branches

Divide into small groups with one magnetic compass per group and follow these instructions. Stand beside the trunk of a tree. By using the compass, determine in which directions the main branches of the tree are growing. Record the information as well as the type of tree you are examining. Do more branches grow in one direction? If so what is that direction? Do other trees of the same type have a branching pattern? Is the branching pattern affected by buildings, other trees, and the prevailing winds?

OBSTACLES

On compass walks, it is very probable that you will encounter lakes, swamps, buildings and other obstructions that you cannot go through. When the obstacle is a lake or open swamp where you can see the other side, the procedure is very simple. Find, on the far side, some landmark that lies on your course, walk around to it, and resume your bearing from there. Once there, however, you should make a check on the position by sighting back to the original point (as described in Returning to Starting Point). It is wise to mark this point where you break out on a lake or swamp, because it sometimes happens that when you reach the opposite side, the landmark you chose cannot be located with certainty. At the same time, the exact point from which you came may also prove hard to locate. When this happens, you have no way to check the exact location of your line of travel, and may have to retrace your steps to relocate it. A marker made from a scrap of paper, a small heap of stones, or a piece of driftwood will prevent this from happening by allowing you to take a back-bearing.

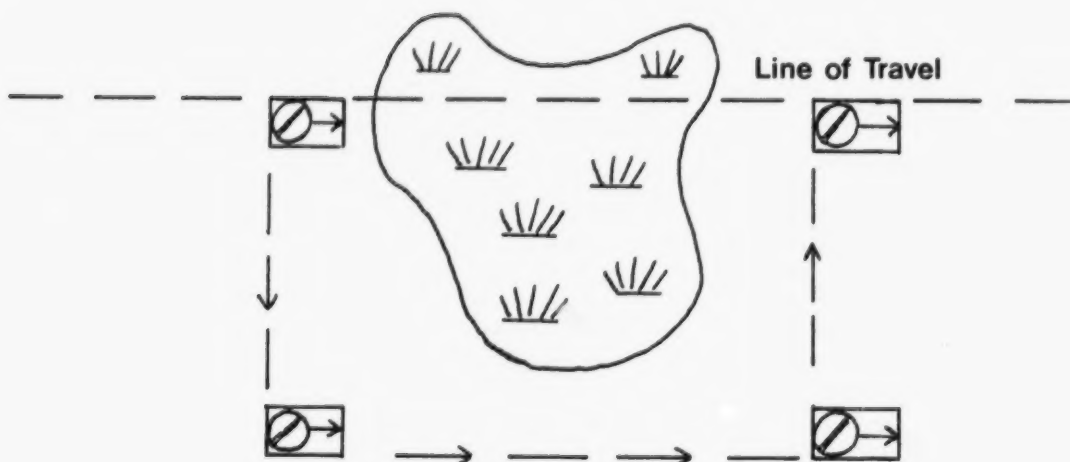


If you cannot see across or through the obstacle, you will have to go around it. This can be accomplished by using right angles. To go around an obstacle to the right:

1. Turn to the right until you are facing at about right angles to your line of travel then orient your compass. Sight along the rear edge of the base plate (which is at right angles to the line-of-travel arrow), and select a landmark. Walk toward it, counting your paces until you are beyond the obstacle.

2. Resume your original bearing. Again walk till you are clear of the obstacle.
3. Turn left, re-orient your compass, again sight along its back edge at a landmark, and walk exactly the same number of paces as you did to the right. You are now back on your original line with the obstacle behind. To pass an obstacle to the left, simply reverse the above procedure.

METHOD OF GOING AROUND OBSTACLES



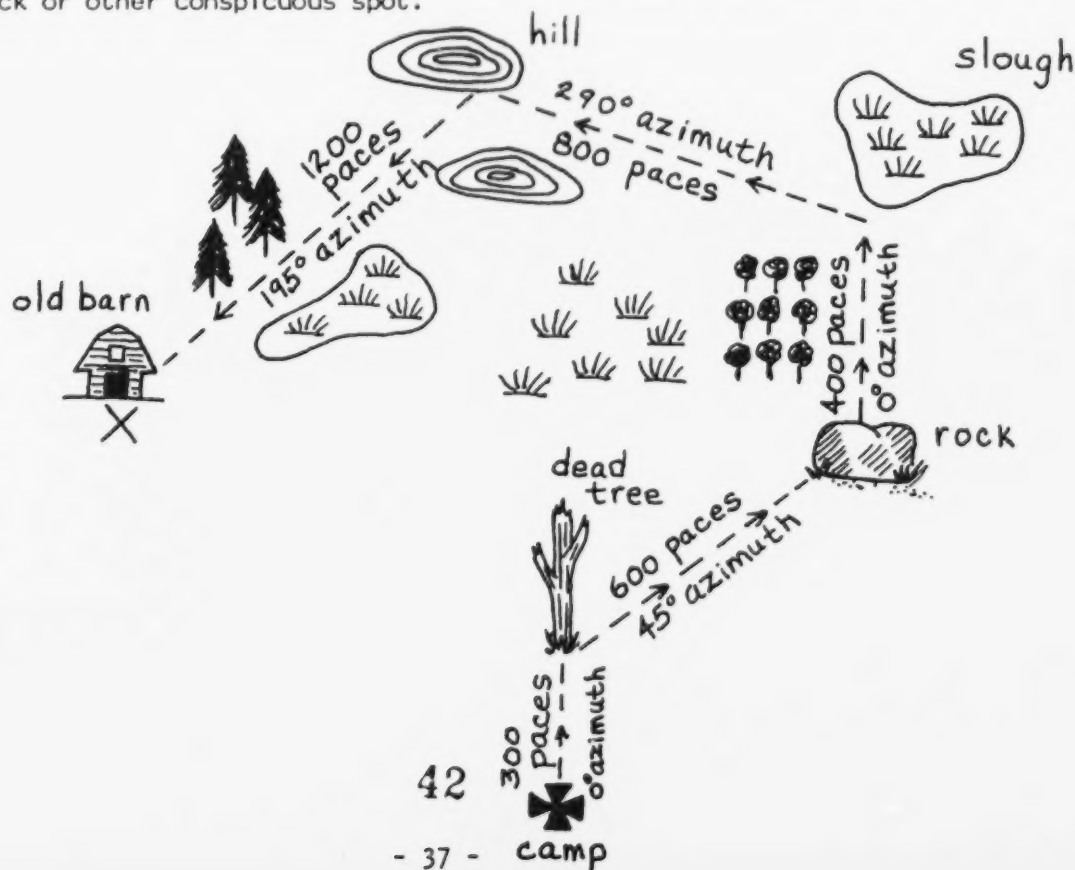
NOTE: Because the compass needle is magnetized, it is attracted by iron. This means you will not get a true compass reading alongside iron tools or an automobile, or on a steel bridge. Hydro lines and iron ore deposits in the ground may also deflect the needle if you are standing near them.

COMPASS GAMES

You and your fellow outdoorsmen may wish to practice your compass skills by playing one or two compass games.

1. Construct a set of 16 cards carrying the 16 points of the compass and place them in the center of a circle drawn on the ground. Divide the group into teams. Position a team on a starting line 8 metres from the circle. On a signal from your leader, the team members run to the circle and try to place the 16 cards in the proper place on the circle. The team which completes the circle correctly in the shortest time wins the game.
2. Divide the group into teams and direct each team to select a "point-finder". Each "point-finder" is provided with a compass. As your leader calls out various compass points the "point-finders" try to position a team member at that point on a large circle. The first team to place a man correctly wins that point. The team with the most points wins the game.
3. Hares and Hounds - One team, the "hares", is given a twenty minute start over the "hounds". It lays a compass trail. The hounds follow the trail and try to catch the hares. When they see the hares, the hounds may give chase and the hares may stop marking the trail. Restrict the time and area allotted to this game.

Laying the trail - Every time the hares change direction they must leave a note giving their new compass bearing and place it on a rock or other conspicuous spot.



RESOURCE MAP

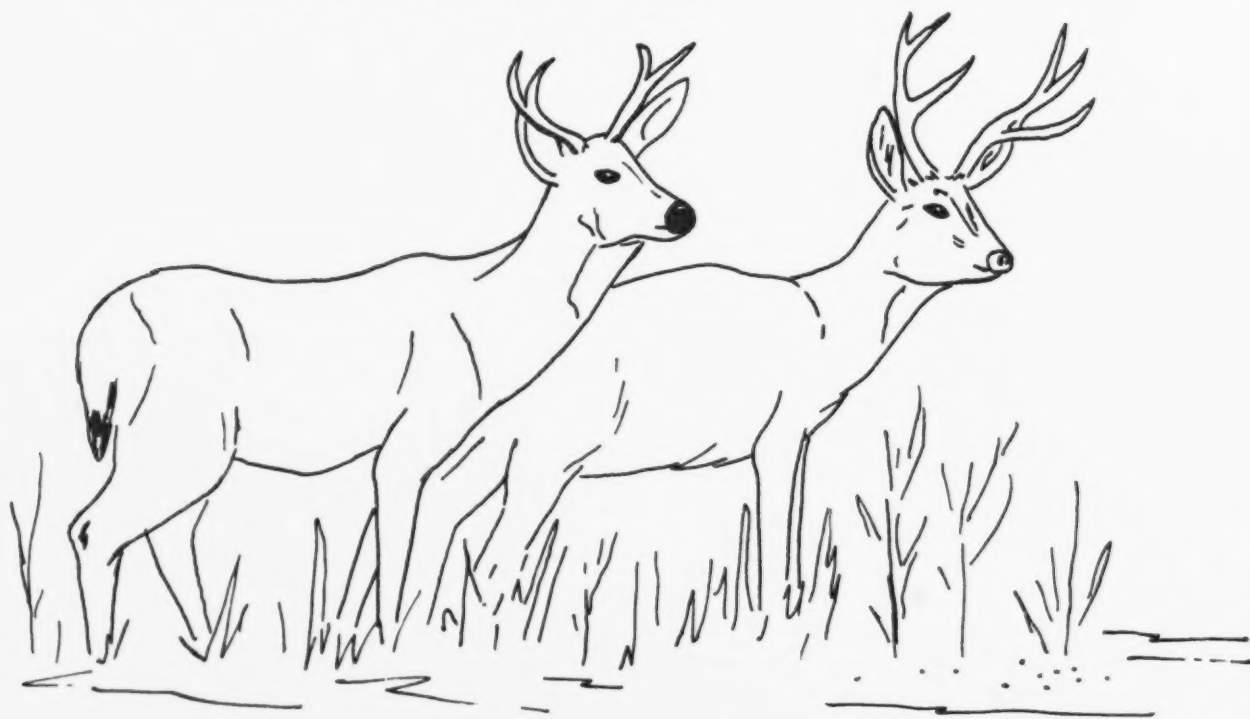
A map of wildlife resources should show all the kinds of wildlife that are present in any area you choose to map. It is important in your wildlife project to learn how to check an area of land and how to prepare an accurate, informative, scaled map that shows the wildlife actually in the area. You must be very observant and careful if you want to make a good map.

HOW TO MAKE A RESOURCE MAP

Choose an area where there is wildlife. It may be the woods, a local park, part of a river or creek bank, forested area, pond, lake, or fence row. If you live in the city, or if an aerial photo is not available, ask your parents or leader to go along with you to the area you have chosen. Draw a map of the resource area.

Remember - you don't need to map a large land area or a whole farm. An acre or so is quite large enough. (An acre is an area about the size of a football field.) Probably you will need a week or so to make a good map. Visit the mapping area several times and at different times of the day to be sure your survey of the wildlife resources in the area is complete.

On the map or in a separate diary, indicate when and where you found animals, the kind of animals, and kind of habitat where you saw them, such as fence row, rock pile, or pond.

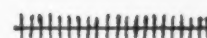


RESOURCE MAP SYMBOLS

ROADS

 Private

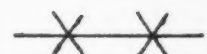
 Public Highway

 Railroad

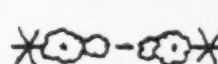
BOUNDARIES

 Resource area edge
(when not a field
edge or fence)

 Field boundary

 Wire Fence

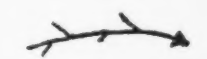
 Stone Fence Row

 Shrubs and Trees
in fence row

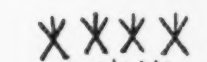
LAND USE PRACTISES

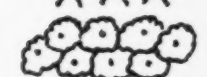
 Sod waterway

 Terrace

 Diversion Dike

 Shelterbelt or Windbreak

 Crop Planting

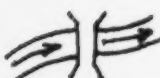
 Woodland

OTHER

 Buildings

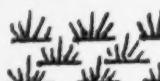
 Spring

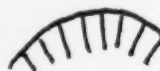
 Permanent Stream

 Bridge

 Lake, pond or
reservoir

 Scrubland

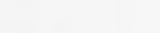
 Marsh (mostly
grass and cattails)

 Steep Slopes

 Eroded Area
(wind or water)

 Streambank erosion

 Drainageway
(crossable with
farm machines)

 Gully

 % slope and direction

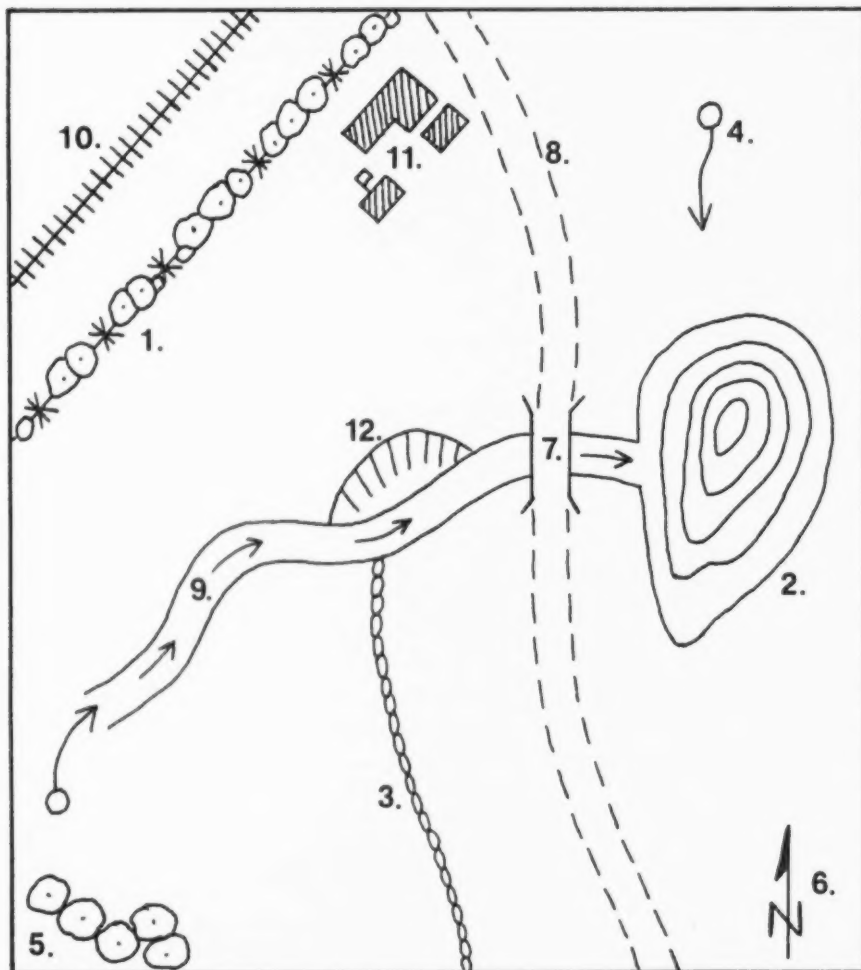
 Reference No. for
special note

 North arrow



ACTION TIME - Map Symbols

Study the map symbols in your manual. Then identify the features on this map by filling in the correct name beside the number. Answers found in Leader's Guide.



1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____

13. 1cm = 50m

RECORDS AND RECORD KEEPING

PURPOSE OF RECORD KEEPING

1. record of information
2. record of work done
3. learning how to keep records
4. record of club activities
5. record of achievement

WHAT IS A GOOD RECORD BOOK?

1. COMPLETENESS - If any part of a record book is not finished, it detracts from the rest.
2. ACCURACY - Keep an accurate account of the costs involved to give your calculations some meaning.
3. PICTURES AND ILLUSTRATIONS - Add originality and interest to the records. At the Achievement or Visitors' Day you should have a picture of your wildlife observations, outdoor activity, and of the project members and leaders in your record book.
4. NEWS SECTION - This should include a record of 4-H activities at local, provincial, national, and international levels. 4-H News should be collected throughout the year. When an item is clipped from the paper, the date and name of the paper should be written onto the clipping.
5. NEATNESS - Neatness is important in completing your record book. However, it is understood that the record book is completed throughout the entire year and not just the day before the Achievement or Visitors' Day.

4-H OUTDOORSMAN RECORD BOOK

MEMBER'S NAME _____

ADDRESS _____

AGE _____ BIRTHDATE _____

NAME OF PARENT OR GUARDIAN _____

NAME OF CLUB _____

NAME OF CLUB LEADER _____

NAME OF PROJECT LEADER _____

NO. OF YEARS IN 4-H _____ NO. OF YEARS IN PROJECT _____

ACHIEVEMENT DAY PROJECTS AND ACTIVITIES IN THE OUTDOORS



ANIMAL OR BIRD STUDY

Now how do you go about studying a particular bird or animal? First of all, you have to know what it looks like. With animals this is usually easy. It's hard to mistake a deer for a rabbit, but birds are much smaller and faster and so they are harder to recognize. To find out what your bird looks like, the first thing to do is find a picture or a description. Then you must use your eyes. It might be an idea to find out what this bird eats and put some food out on a birdfeeder or bird house. Then watch to see how many of your birds come, what other birds come, how different birds get along with one another, or when the nest is made. Note whether males and females are different, whether they both sit on the nest or only one sits, and how many chicks are hatched. What happens if other birds or animals come near the nest? And so on. This way, you will get to know the habits of the particular bird you study.

To study your bird or animal in its environment, it is a good idea to make a Resource Map. Using the symbols, draw the map of the area you have chosen. If possible, draw to scale and identify the trees and shrubs included in it. Now you can patrol your Resource Area and make a note of any wildlife activity you see, especially any activity that has to do with the particular animal you are studying.

The best way to do this is to make up a checksheet like the one following. A collection of these checksheets will contain all the necessary information you will need to answer questions.



Using the following chart as a guide, record your observations of the birds and animals that you have seen on your outdoor hikes. Use a separate chart for each bird or animal. Include these in your outdoor notebook.

b) Scientific name: _____

a) Voice sounds: (Describe)

What food is eaten?

How often?

Where does the food come from in winter? In summer?

III Habits: cont'd.

b) Hibernation:

Where does the animal hibernate? How long? _____

What happens during hibernation? _____

c) Breeding:

How often are babies born? _____

How many young are born? _____

What is the gestation period? _____

What are the babies called? _____

Do the parents select a lifetime mate? _____

How are the young looked after? _____

d) Migration:

What fly-route is followed? (Include a small map)

d) Migration: cont'd.

What is the final destination? (Mark on map) _____

How many kilometres will the entire route cover? _____

How long will it take to travel the entire distance? _____

How long would it take you to drive that distance by car? _____

When do the birds leave? _____

When do they return? _____

IV Habitat:

Where does the bird or animal live? _____

Where will the living things move if man takes over the natural
environment? _____

V Are the birds or animals beneficial or harmful to man? How? _____



RECORD OF WILDLIFE OBSERVATION

DATE	TIME	WEATHER	KIND OF WILDLIFE	HOW MANY	WHERE SEEN?	WHAT WAS THE ANIMAL DOING?	WHERE DID THE ANIMAL HIDE?
Example Aug. 7	7:00 am	cloudy	deer	1	near forest	eating	in forest
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							

52

Summarize your animal and bird observations on this chart.



PLANT LOG



I displayed the following plants in my outdoor book. (Mount photos, drawings, or actual specimens in your outdoor notebook.)

Wild Plant Observations

Date Seen	Plant	Economic Importance	Habitat	Remarks



MAKING PLASTER CASTS

Materials

To make casts you need plaster of Paris, a large container for mixing plaster and water, and a "form" or "collar" made of wood, cardboard, a cut-off can, or similar material. The form is to be placed around the track to keep the plaster from spreading and give uniform size to all casts made.

HINT: When carrying casting materials with you on a hike or field trip store your plaster of Paris in a tight container.

Steps in Making a Cast

1. Brush away twigs, stones, or dirt lumps in or near the track.
2. Place the cardboard strip around the track and clip the ends together with paper clips or staple them. Press the cardboard ring down firmly into the dirt. This will prevent the plaster from flowing out underneath the paper. Or if making casts in the snow, make sure the cardboard is deep enough in the snow - but don't disturb the track while doing this.
3. For each 250 millilitres of water you pour into the mixing can, sprinkle in about 400 millilitres of plaster of Paris and mix thoroughly. The plaster should be the consistency of thick cream or pancake batter.
4. Quickly pour this mixture into the cardboard ring to a depth of 3 to 4 centimetres. This depends of course on the size of the track - the deeper the track the deeper the mold should be. Leave about 35 centimetres space around the track.
5. When the plaster has hardened (about half an hour), pick up the cast and peel off the cardboard. The cast can now be cleaned by gently using an old toothbrush.

HINT: If you are rushed for time, you can let this harden for 10 to 15 minutes. Then wrap it in an old cloth and carefully take it home to let it dry overnight.

6. What you have now is a negative cast of the animal's track.

7. When the cast is thoroughly dry, make a positive track. Place a higher "form" or cardboard ring around the negative cast. Use a light oil or vaseline to grease the face of the cast. Mix more of the plaster of Paris, pour it into the form, level it off and press the first cast into the wet plaster. Allow it to dry for at least twenty minutes, then remove the cast. Now the track will appear as it did in the ground. Use this one for your Achievement Day exhibit.

HINT: For making casts in snow, stir some snow in the plaster mixture to cool it so it will not melt the track. With a small perfume atomizer, lightly spray the track with cold water before you pour in the plaster. The water will form an ice glaze that will prevent melting and destruction of the track.

I made plaster casts of the following tracks and displayed them in my outdoor kit:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____



USING YOUR COMPASS

Place a stake in the middle of a field. This will be the starting point for the three compass exercises that follow.

Fill in the last bearing and distance on the following exercises.

<u>Exercise No. 1</u>	<u>Exercise No. 2</u>	<u>Exercise No. 3</u>
225° - 16 metres	217° - 32 metres	202° - 35 metres
21° - 32 metres	345° - 19 metres	336° - 51 metres
253° - 17 metres	73° - 34 metres	80° - 60 metres
137° - 37 metres	345° - 7 metres	184° - 42 metres
280° - 11 metres	266° - 15 metres	264° - 27 metres
___ - ___ metres	___ - ___ metres	___ - ___ metres



ACTION TIME - Wildlife Puzzle

Can you find and circle the hidden animals and birds?
They read vertically, horizontally, diagonally,
forwards, and backwards.

a t a s m b e a v e r h a l o k s a b
n l a k a l o h m i b e x u l k a e k
t a e t n a p o k o l i m b w e s t w
g n i p t c r t a r u k m a o c p a l
o k o l i k z l p e d s h e v h f b w
f i n w c b h p q t p g e r x i a l u
b n r a o i b f o t n e o h t c j u z
o e t a f r n c m o q d h i s k v e y
n a k t s d r l g n w r g s u a w j y
l m r o b i n a n t e l o p e d a a z
y x e q m a m t p m f j p k l e b y l
w h e r o n a m e s r c h a k e o y l
l n d m l e r t n o x p e l m q y r s
a y b l e a c a r s o b r c a l b n e
d c j s b w s a m r f t a s a m s k x
t e l b v z t e r l a c h e w o a n m
f a i g m f r e o a n i t b a o o n t
h t j s p u a w r l y n x e i s o q u
k m a g p i e e b e c n o a v e a s c
n r o x t y k a n g a r o r o d e n t

owl
sparrow
moose
robin
gopher
otter

hawk
wren
bluejay
fox
heron
lynx

deer
blackbird
magpie
wolf
mouse
chickadee

antelope
bear
rabbit
mole
beaver



SPECIAL ACTIVITIES PARTICIPATED IN

Field Days, Rallies, Fair, etc.

DATE	KIND OF ACTIVITY	I TOOK PART BY:



RECORD OF PROJECT MEETINGS

Project Meeting Date	Material covered about project	I put this new knowledge to use by:

GLOSSARY FOR MAP AND COMPASS WORK

Back-Bearing - the direction or bearing from a visible landmark to your location, used in taking cross-bearings.

Base Plate - the rectangular plate of the Orienteering compass on which the compass housing is mounted.

Bearing - direction of an object stated in compass degrees.

Cardinal Points - the four principal points of the compass: north, west, south, and east.

Contour Interval - distance in height between one contour line and the one next to it.

Contour Line - an imaginary line in the field along which every point is at the same height above sea level.

Cross-Bearings - two or more bearings which, when transferred to a map, indicate your location at the point where they cross.

Declination - the angle between the direction toward which the compass needle points and the true north line (also called variation).

Hydrographic Features - streams, lakes, etc.

Hypsographic Features - hills, valleys.

Intercardinal Points - the four points of the compass between the four cardinal points i.e. NE, SE, SW, NW.

Latitude - imaginary lines on the globe running parallel to the Equator; distance in degrees north and south from Equator.

Longitude - imaginary lines on the globe running from pole to pole; distance in degrees east and west from Greenwich, England.

Meridian Lines - lines on the map running true north to true south.

Orientation - the process of determining one's location in the field with the help of landscape features, map, and/or compass.

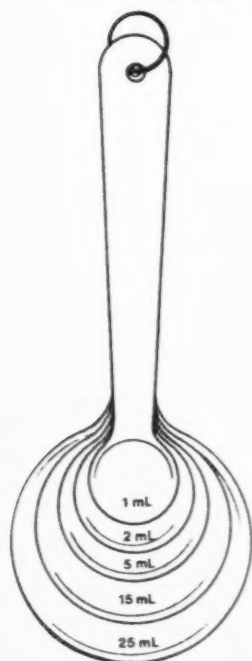
Orienteering, Compass - holding compass in such a way that the direction of its dial coincides with the same directions in the field; done by turning the whole compass, with the dial set at a degree number, or by twisting the compass housing with the direction-of-travel arrowhead pointing toward a landmark until the compass needle coincides with and is parallel with the orienting arrow of the compass housing.

Orienting, Map - turning a map in such a way that what is north on the map corresponds with north in the field.

Pace - the distance covered from left foot to left foot, or right foot to right foot.

METRIC INFORMATION

Approximate Conversion to
Metric Measures



METRIC MEASURES ARE
AVAILABLE IN THESE SIZES

250 mL replaces 1 cup
500 mL replaces 2 cups



MUNSTER METRE
MEASURES LENGTH

SYMBOL	WHEN YOU KNOW	MULTIPLY BY	TO FIND	SYMBOL	BASE UNIT
--------	------------------	----------------	------------	--------	-----------

MASS (weight)

oz.	ounces	28.349	grams	g	
lb.	pounds	0.454	kilograms	kg	
ton	short tons (2000 lbs)	0.907	tonnes	t	gram
g	grams	0.035	ounces	oz.	
t	tonnes (1000 kg)	1.102	short tons	ton	

VOLUME

tsp.	teaspoons	5	millilitres	mL	
tbsp	tablespoons	15	millilitres	mL	
fl.oz.	fluid ounces	28.413	millilitres	mL	
pt.	pints	0.568	litres	L	
qt.	quarts	1.137	litres	L	
gal.	gallons	4.546	litres	L	litres
bu.	bushels	36.370	litres	L	
mL	millilitres	0.035	fluid ounces	fl.oz.	
L	litres	1.760	pints	pt.	
L	litres	0.880	quarts	qt.	
L	litres	0.220	gallons	gal.	
L	litres	0.027	bushels	bu.	

LENGTH

in.	inches	2.540	centimetres	cm	
ft.	feet	0.305	metres	m	
yd.	yards	0.914	metres	m	
mi.	miles	1.609	kilometres	km	
mm	millimetres	0.0394	inches	in.	metre

cm	centimetres	0.394	inches	in.	
m	metres	3.281	feet	ft.	
m	metres	1.094	yards	yd.	
km	kilometres	0.621	miles	mi.	

ENERGY

kcal	kilocalorie	4.186	kilojoules	kJ	joule
kJ	kilojoules	0.239	kilocalories	kcal	



SAM KILOGRAM
MEASURES WEIGHT



LILY LITRE
MEASURES VOLUME

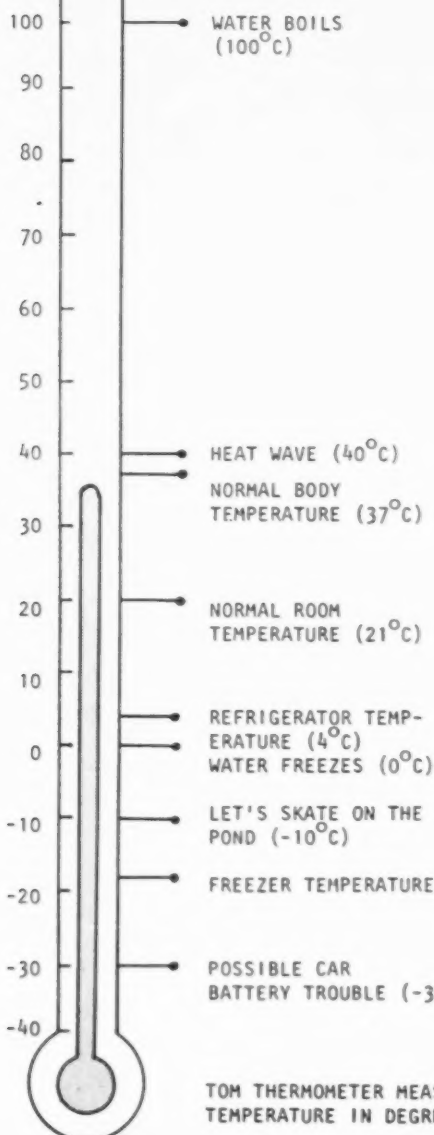
METRIC MULTIPLES AND PREFIXES TABLE

Multiplying Factor	Prefix	Symbol
1,000,000 = 10^6	mega (meg a)	M
1,000 = 10^3	kilo (kil o)	k
100 = 10^2	hecto (hek to)	h
10 = 10^1	deka (dek a)	da
(Base Unit) 1 = 10^0		
0.1 = 10^{-1}	deci (des i)	d
0.01 = 10^{-2}	centi (sen ti)	c
0.001 = 10^{-3}	milli (mil i)	m
0.000,001 = 10^{-6}	micro (mi kro)	μ

(These prefixes may be applied to all metric base units.

Example: Base Unit = litre

Add kilo to litre (symbol kL) = kilolitre. The multiplying factor is 1000. This means a kilolitre equals 1000 litres.)



TOM THERMOMETER MEASURES TEMPERATURE IN DEGREES CELSIUS ($^{\circ}\text{C}$)

TEMPERATURE: $^{\circ}\text{F} = 9/5 + 32$
 $^{\circ}\text{C} = 5/9 - 32$

OVEN TEMPERATURES:

	$^{\circ}\text{C}$	$^{\circ}\text{F}$
Very slow	120-135	250-275
Slow	150-165	300-325
Moderate	175-190	350-375
Hot	200-220	400-425
Very Hot	230-245	450-475
Near boil	245-290	475-500

ADDITIONAL METRIC INFORMATION

from:

Metric Branch
 Alberta Government Services
 12th Floor, Park Square
 10001 Bellamy Hill
 Edmonton, Alberta T5J 3C1

Metric Commission Canada
 Box 4000
 Ottawa, Ontario

Information Division
 Canada Department of Agriculture
 Ottawa, Ontario K1A 0C7

District Extension Office
 OR

Publications Office
 Alberta Agriculture
 9718 - 107 Street
 Edmonton, Alberta T5K 2C8

PROJECT EVALUATION

In order to keep meeting your needs in the 4-H program, we would like to request your assistance in completing this evaluation form. Make your suggestions on this sheet as you use this book. After the project has been completed, mail this form to:

Project Evaluation
4-H Branch
Alberta Agriculture
7000 - 113 Street
Edmonton, Alberta
T6H 5T6

This image shows a single page of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

(use another page if required)